



United States
Department of
Agriculture

Research
Education
Economics

Office
of the Under
Secretary

Room 216W
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APR 01 2015

Mr. Richard Keigwin
Director, Pesticide Re-evaluation Division
Office of Pesticide Programs
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW.
Washington, D.C. 20460

Dear Rick:

This is an official transmittal from my office of the Agricultural Research Service's comments on soybeans and neonicotinoids.

Thank you for considering this new information.

Regards,

A handwritten signature in black ink, appearing to read "Ann M. Bartuska", followed by a horizontal line.

Ann M. Bartuska
Deputy Under Secretary
for Research, Education, and Economics

cc:

Jim Jones, EPA
Sheryl Kunickis, ARS

ARS Comment to EPA's public docket for the Agency's assessment of benefits of neonicotinoid seed treatments to soybean production.

USDA-ARS welcomes the opportunity to respond to the initiative EPA has taken to review the value of neonicotinoid seed treatments on soybeans and potentially other crops. There has been a long-standing question about whether the widespread use of neonicotinoids will accelerate evolution of resistance in target-pest populations. Added to this concern are myriad questions regarding negative effects of neonicotinoids on honey bees and other non-target organisms. As EPA gathers information for its risk-benefit analyses, it will be important to understand as fully as practicable the risk a grower faces from pests in the absence of a neonicotinoid seed treatment. Our main goal in this comment is to convey our view that there is no simple answer to the question of whether neonicotinoid seed treatments have value as a prophylactic treatment in soybeans, and most other crops for that matter. It is a complicated situation with many facets and important nuances that must be considered. We emphasize some of the more important pest management considerations here.

Use of neonicotinoid seed treatments is prophylactic, in the sense that growers do not have current-year knowledge of target pest pressure when they purchase their seed. Prophylactic use of an insect management tool is not necessarily a bad idea, and such a strategy can play a central role in an Integrated Pest Management (IPM) program depending on the context – host plant resistance is the classic example, because it eliminates or reduces the need for in-season rescue treatments. Use of transgenic Bt crops also is prophylactic by nature. Neonicotinoid seed treatments cost ~ \$7-8/ac (as reported in the EPA memorandum). From an IPM point of view, the value to a grower should outweigh this cost, at least when averaged over years, for use to be economically justified. Neonicotinoid seed applications are purported to provide early-season, broad-spectrum pest control, enhancing plant vigor and crop yield potential.

Pest complexes and cropping practices vary widely across U.S. soybean production regions. The abundance and diversity of different pest populations also vary, even within different production regions. Projecting the frequency and intensity of pest infestations is an important management consideration, especially when one is making pest control decisions at planting. Using neonicotinoid seed treatments for protection against a certain pest in one region of the country may be justified much of the time, whereas prophylactic protection against the same pest in another part of the country may be seldom warranted. For example, soybean growers in the southern U.S. face a much more diverse and serious threat from insect pests than growers in the Midwest, and the value of protection afforded by prophylactic insecticides likely will vary accordingly.

In the case of soybean, neonicotinoid seed treatments primarily target minor, sporadic or occasional pest problems. While damage by these pests certainly can be quite severe under certain conditions, losses are usually minor, and serious losses are sporadic in space and time. This is why they are considered "minor" or "occasional" pests. Even infestations by some primary pests like soybean aphid are sporadic, because colonization of a specific field in a given year depends on insect dispersal, which in turn depends on the vagaries of local weather and many other variables. Information on pest pressure by scouting is often the best way to assess

need for control, but for many of the pests targeted by neonicotinoid seed treatments, especially below-ground insects, scouting is impractical or there is no viable rescue treatment available once a real-time problem is detected. In these cases, prophylactic seed treatments may be warranted if predicted risk of damage is high enough.

There are environmental and pest situations that can significantly increase the risk of an economic infestation by a specific pest in a particular field in a particular year. These include scenarios of crop rotation, soil type, landscape features and a field's relative position within it, ambient weather, overwintering mortality, mobility of the insect, population cycles and history of infestation, weed complex and prevalence in a field, natural enemy complex and prevalence, planting date, tillage, crop residue management, and biotic/abiotic interactions arising from these. For example, wireworms and white grubs are below-ground pests that are a serious concern in fields rotating out of pasture, CRP land, or certain other crops (e.g., cereals, potatoes); in areas of silty or sandy soils including knolls within fields; and in early-planted fields during a cool wet spring. Risk from white grubs further increases if fields are near tree lines or adjacent to pastures. Both of these insects spend multiple years as larvae in the soil, so risk does not automatically dissipate after one year. Seed maggots present a higher risk in fields that received manure or buried green matter before planting, but they are not a significant risk in no-till fields. Black cutworms are a risk if the field was weedy before planting and if winds from overwintering regions were favorable for long-distance transport of migrant females into the area. Fields with few weeds are usually not at risk even when winds are favorable, because egg-laying females will not be attracted to them. Such examples are indicative of the complex nature of infestation and population dynamics of minor and occasional pests.

These examples illustrate that scenarios putting fields at risk of serious secondary pest pressure are not uniformly distributed in space or time, but neither are they rare. Some fields undoubtedly will benefit from protection by neonicotinoid seed treatments in some years while others will not. A one-size-fits-all assessment of value of neonicotinoid seed treatments is not possible except from a very high vantage point that deals with overall averages. In USDA, we are concerned with providing tools to individual growers and their advisors to assist them in making good pest management decisions on their farms, and overall averages are not always the best tool for determining the best course of action on the scale of individual farms.

We caution that the very widespread use of neonicotinoid seed treatments on soybeans and other crops cannot be taken as direct evidence of their value to growers, because in most cases untreated seed of the varieties desired by a grower is not available for purchase. In other words, declining treatment is generally not an option for a grower under current market circumstances. We also caution against assuming that non-use of seed treatments will automatically necessitate replacement by some other form of protection against the target pests. The need for any pest control approach depends on pest pressure or, in many cases, the risk of pest pressure, for which national or even regional averages are not sufficiently informative.

Information and development of risk factors for minor and occasional pests targeted by neonicotinoid seed treatments are among the first steps in assessing their value to growers and American agriculture. For the reasons presented above, these are complicated questions for which simple answers cannot be expected. At a minimum, the realized benefits of neonicotinoid

seed treatments will vary depending on crop and region of the country. In reality, as described above, they will vary depending on many additional interacting variables as well. It will be important to understand these variables when weighing the benefits of these compounds against the risks to the environment, and in designing the most appropriate path forward. USDA-ARS scientists and others are actively engaged in synthesizing what is already known that can be of potential use in assessing the value of neonicotinoid seed treatments for major U.S. crops, and in conducting meta-analyses of relevant published and unpublished data. The results should reveal the most serious knowledge gaps that we (the scientific community) can most profitably address in future research.